

(19) World Intellectual Property Organization  
International Bureau



(43) International Publication Date  
6 June 2002 (06.06.2002)

PCT

(10) International Publication Number  
WO 02/43807 A2

(51) International Patent Classification<sup>7</sup>: A61P 15/00,  
3/10, 3/06, A61K 45/06, 31/55

Singh [US/US]; 49 Osborne Avenue, New Providence, NJ  
07974 (US).

(21) International Application Number: PCT/EP01/13976

(74) Agent: BECKER, Konrad; Novartis AG, Corporate  
Intellectual Property, Patent & Trademark Department,  
CH-4002 Basel (CH).

(22) International Filing Date:

29 November 2001 (29.11.2001)

(25) Filing Language:

English

(26) Publication Language:

English

(30) Priority Data:

60/250,540 1 December 2000 (01.12.2000) US

(81) Designated States (*national*): AE, AG, AL, AM, AT, AU,  
AZ, BA, BB, BG, BR, BY, BZ, CA, CH, CN, CO, CR, CU,  
CZ, DE, DK, DM, DZ, EC, EE, ES, FI, GB, GD, GE, GH,  
HR, HU, ID, IL, IN, IS, JP, KE, KG, KP, KR, KZ, LC, LK,  
LT, LU, LV, MA, MD, MK, MN, MX, NO, NZ, OM, PH,  
PL, PT, RO, RU, SE, SG, SI, SK, TJ, TM, TR, TT, UA, US,  
UZ, VN, YU, ZA, ZW.

(84) Designated States (*regional*): Eurasian patent (AM, AZ,  
BY, KG, KZ, MD, RU, TJ, TM), European patent (AT, BE,  
CH, CY, DE, DK, ES, FI, FR, GB, GR, IE, IT, LU, MC,  
NL, PT, SE, TR).

(71) Applicant (*for all designated States except AT, US*): NO-  
VARTIS AG [CH/CH]; Lichtstrasse 35, CH-4056 Basel  
(CH).

Published:

— without international search report and to be republished  
upon receipt of that report

(71) Applicant (*for AT only*): NOVARTIS-ERFINDUNGEN  
VERWALTUNGSGESELLSCHAFT M.B.H. [AT/AT];  
Brunner Strasse 59 A-1230 Vienna (AT).

*For two-letter codes and other abbreviations, refer to the "Guid-  
ance Notes on Codes and Abbreviations" appearing at the begin-  
ning of each regular issue of the PCT Gazette.*

(72) Inventor; and

(75) Inventor/Applicant (*for US only*): SAHOTA, Pritam,

WO 02/43807 A2

(54) Title: COMBINATION OF ORGANIC COMPOUNDS

(57) Abstract: The present invention relates to methods of treating sexual dysfunction associated with hypertension and another condition by administering a pharmaceutical combination of an angiotensin receptor blocker with either an anti-hypertensive drug or an HMG-CoA reductase inhibitor.

Best Available Copy

### Combination of Organic Compounds

Sexual dysfunction (SD) is more commonly observed in hypertensive patients especially those with diabetes and/or hyperlipidemia. Further, many commonly used anti-hypertensive drugs such as diuretics and beta-blockers can interfere with sexual function in both sexes, causing loss of libido, impairment of erectile function and ejaculation in men and delay or prevent orgasm in women. A specific angiotensin receptor blocker or antagonist (ARB), losartan, has been shown to have an advantage in preservation of sexual function when used clinically for the treatment of hypertensive disorder in male rats. Chan P. et al., Pharmacology, 58(3): 132-9 (1999). It has also been suggested that administration of ARBs result in smooth muscle relaxation and thus erection in an anesthetized dog. Kifor I. et al., J. Urol., 157(5): 1920-1925 (1997). However, heretofore, there has not been a suitable treatment for SD associated with hypertension. Because of low response (40-55% efficacy) to antihypertensive monotherapy, combination therapy for hypertension (>80% efficacy) has to be used in a large number of patients.

Accordingly, there is a need for a method of treating a patient suffering from SD associated with hypertension comprising administering a therapeutically effective amount of a pharmaceutical combination to the patient, wherein the pharmaceutical combination comprises as active ingredients:

- (i) an ARB or a pharmaceutically acceptable salt thereof; and
- (ii) (a) an anti-hypertensive drug or a pharmaceutically acceptable salt thereof or (b) a statin or a pharmaceutically acceptable salt thereof. The pharmaceutical combination may be administered as a pharmaceutical composition comprising the pharmaceutical combination and a pharmaceutically acceptable carrier.

There is also a need for a method of treating a patient suffering from SD associated with hypertension and another condition, including but not limited to diabetes and hyperlipidemia comprising administering a pharmaceutical combination to the patient, wherein the pharmaceutical combination comprises as active ingredients:

- (i) an ARB or a pharmaceutically acceptable salt thereof; and
- (ii) (a) an anti-hypertensive drug or a pharmaceutically acceptable salt thereof or (b) a statin or a pharmaceutically acceptable salt thereof.

- 2 -

Toward these ends, and others, an aspect of the present invention provides a method of achieving a therapeutic effect for treating a patient suffering from SD associated with hypertension comprising administering a therapeutically effective amount of a pharmaceutical combination comprising as active ingredients (i) an ARB or a pharmaceutically acceptable salt thereof; (ii) (a) an anti-hypertensive drug or a pharmaceutically acceptable salt thereof or (b) a statin or a pharmaceutically acceptable salt thereof to a patient in need thereof.

In another embodiment of the present invention there is provided a method of achieving a therapeutic effect for treating a patient suffering from SD associated with hypertension and another condition, including but not limited to diabetes and hyperlipidemia comprising administering a pharmaceutical combination to the patient, wherein the pharmaceutical combination comprise as active ingredients (i) an ARB or a pharmaceutically acceptable salt thereof; and  
(ii) (a) an anti-hypertensive drug or a pharmaceutically acceptable salt thereof or  
(b) a statin or a pharmaceutically acceptable salt thereof to a patient in need thereof.

Other objects, features, advantages and aspects of the present invention will become apparent to those of skill from the following description. It should be understood, however, that the following description and the specific examples, while indicating preferred embodiments of the invention, are given by way of illustration only. Various changes and modifications within the spirit and scope of the disclosed invention will become readily apparent to those skilled in the art from reading the following description and from reading the other parts of the present disclosure.

The term "synergistic" as used herein means that the effect achieved with the methods and compositions of the present invention is greater than the sum of the effects that result from methods and compositions comprising the active ingredients of this invention separately.

The term "statin", where used in the specification and the appendant claims, is synonymous with the terms "3-hydroxy-3-methylglutaryl-Coenzyme A reductase inhibitor" and "HMG-CoA reductase inhibitor." These three terms are used interchangeably throughout the specification and appendant claims. As the synonyms suggest, statins are

inhibitors of 3-hydroxy-3-methylglutaryl Coenzyme A reductase and, as such, are effective in lowering the level of blood plasma cholesterol. Statins and pharmaceutically acceptable salts thereof are particularly useful in lowering low-density lipoprotein cholesterol (LDL-C) levels in mammals, and particularly in humans.

In accordance with an aspect of the present invention there is provided a method of achieving a therapeutic effect for treating a patient suffering from SD associated with hypertension comprising administering a therapeutically effective amount of a pharmaceutical combination comprising as active ingredients (i) an ARB or a pharmaceutically acceptable salt thereof; (ii) (a) an anti-hypertensive drug or a pharmaceutically acceptable salt thereof or (b) a statin or a pharmaceutically acceptable salt thereof to the patient. In another embodiment of this aspect of the present invention the therapeutic effect achieved is synergistic, in that, the therapeutic effect is greater than the sum of the therapeutic effect achieved by the administration of the active ingredients separately.

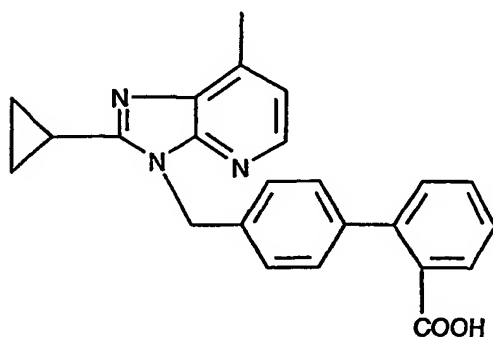
In another embodiment of the present invention there is provided a method of achieving a therapeutic effect for treating a patient suffering from SD associated with hypertension and another condition, including but not limited to diabetes and hyperlipidemia comprising administering a pharmaceutical combination to the patient, wherein the pharmaceutical combination comprise as active ingredients (i) an ARB or a pharmaceutically acceptable salt thereof and (ii) (a) an anti-hypertensive drug or a pharmaceutically acceptable salt thereof or (b) a statin or a pharmaceutically acceptable salt thereof to the patient. In another embodiment of this aspect of the present invention the therapeutic effect achieved is synergistic, in that, the therapeutic effect is greater than the sum of the therapeutic effect achieved by the administration of the active ingredients separately.

In another embodiment of the present invention there is provided the use of a pharmaceutical combination comprising as active ingredients (i) an ARB or a pharmaceutically acceptable salt thereof; and (ii) (a) an anti-hypertensive drug or a pharmaceutically acceptable salt thereof or (b) a statin or a pharmaceutically acceptable salt thereof for the preparation of a medicament for the treatment of a patient suffering from SD associated with hypertension and another condition, including but not limited to diabetes and hyperlipidemia.

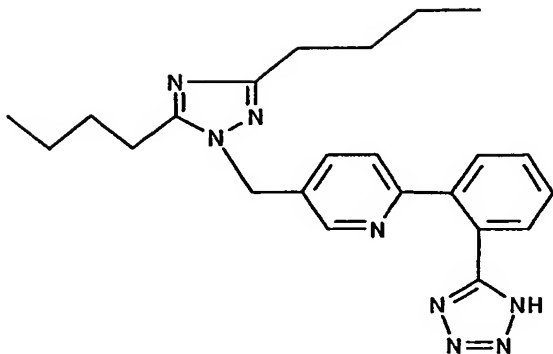
In another embodiment of the present invention there is provided a pharmaceutical composition comprising as active ingredients (i) an ARB or a pharmaceutically acceptable salt thereof; and (ii) (a) an anti-hypertensive drug or a pharmaceutically acceptable salt thereof or (b) a statin or a pharmaceutically acceptable salt thereof and a pharmaceutically acceptable carrier, for the treatment of a patient suffering from SD associated with hypertension and another condition, including but not limited to diabetes and hyperlipidemia.

ARBs (which are called AT<sub>1</sub>-receptor antagonists and angiotensin II receptor antagonists) are understood to be those active ingredients which bind to the AT<sub>1</sub>-receptor subtype of angiotensin II receptor but do not result in activation of the receptor. As a consequence of the inhibition of the AT<sub>1</sub> receptor, these antagonists can, for example, be employed as anti-hypertensives or for treating congestive heart failure.

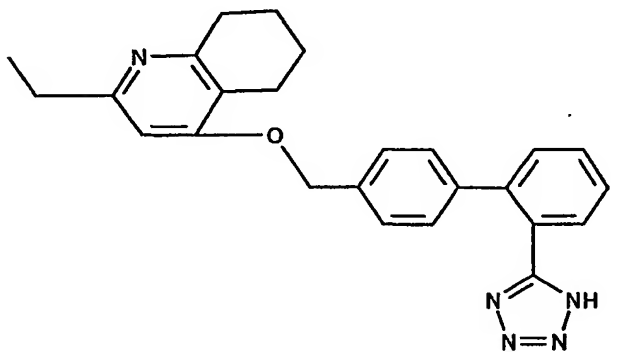
The class of ARBs comprises compounds having differing structural features, essentially preferred are the non-peptidic ones. For example, mention may be made of compounds selected from the group consisting of valsartan, losartan, candesartan, eprosartan, irbesartan, saprisartan, tasosartan, telmisartan, the compound with the designation E-1477 of the following formula



the compound with the designation SC-52458 of the following formula



and the compound with the designation the compound ZD-8731 of the following formula



or, in each case, a pharmaceutically acceptable salt thereof.

Preferred ARBs are those agents which have been marketed, most preferred is valsartan or a pharmaceutically acceptable salt thereof.

Anti-hypertensive drugs within the scope of the present invention include, but are not limited to, calcium channel blockers (CCBs), angiotensin converting enzyme (ACE) inhibitors, diuretics, vasodilators, ARBs,  $\alpha$  and  $\beta$  adrenergic blockers and renin inhibitors as well as combinations of the above, for example, ACE inhibitors plus one of CCBs and diuretics and  $\alpha$  and  $\beta$  adrenergic blockers plus diuretics.

Examples of CCBs useful in the combinations of the present invention are selected from the group consisting of diltiazem, nifedipine, nitrendipine, nimodipine, niludipine, niguldipine, nicardipine, nisoldipine, amlodipine, felodipine, isradipine, ryosidine, verapamil, gallopamil and tiapamil or in each case a pharmaceutically acceptable salt thereof.

The class of ACE inhibitors comprises compounds having differing structural features. For example, mention may be made of the compounds which are selected from the group consisting alacepril, benazepril, benazeprilat, captopril, ceronapril, cilazapril, delapril, enalapril, enalaprilat, fosinopril, imidapril, lisinopril, moveltopril, perindopril, quinapril, ramipril, spirapril, temocapril, and trandolapril, or, in each case, a pharmaceutically acceptable salt thereof.

Preferred ACE inhibitors are those agents which have been marketed, most preferred are benazepril and enalapril or pharmaceutically acceptable salt thereof.

The class of diuretics include carbonic anhydrase inhibitors such as diclorphenamide; loop diuretics such as bumetanide, torsemide, ethacrynic acid and furosemide; potassium-sparing diuretics such as spironolactone, triamterene and amiloride; and thiazides such as hydroflumethiazide, chlorothiazide, hydrochlorothiazide, methychlothiazide, metolazone and chlorthalidone or, in each case, a pharmaceutically acceptable salt thereof.

Vasodilators include nitroglycerin and isosorbide mono- and di- nitrate.

$\beta$  adrenergic blockers include propranolol, bisoprolol and metoprolol.

Renin inhibitors inhibit the action of the natural enzyme renin. The latter passes from the kidneys into the blood where it effects the cleavage of angiotensinogen, releasing the decapeptide angiotensin I which is then cleaved in the lungs, the kidneys and other organs to form the octapeptide angiotensin II. The octapeptide increases blood pressure both directly by arterial vasoconstriction and indirectly by liberating from the adrenal glands the sodium-ion-retaining hormone aldosterone, accompanied by an increase in extracellular fluid volume. That increase can be attributed to the action of angiotensin II. Inhibitors of the enzymatic activity of renin bring about a reduction in the formation of angiotensin I. As a result a smaller amount of angiotensin II is produced. The reduced concentration of that active peptide hormone is the direct cause of e.g. the hypotensive effect of renin inhibitors.

Renin inhibitors include especially non-peptidic representatives, preferably aliskiren (2(S),4(S),5(S),7(S)-N-(3-amino-2,2-dimethyl-3-oxopropyl)-2,7-di(1-methylethyl)-4-hydroxy-5-amino-8-[4-methoxy-3-(3-methoxy-propoxy)phenyl]-octanamide, being specifically disclosed

- 7 -

in EP 678503 A); especially preferred is the hemi-fumarate salt thereof; detikiren (cf. EP 173481A); terlakiren (cf. EP 266950 A); and zankiren (cf. EP 229667 A). Especially preferred is aliskiren, preferably the hemi-fumarate thereof.

Statins include atorvastatin, cerivastatin, fluvastatin, lovastatin, pitavastatin, pravastatin, and simvastatin, or, in each case, a pharmaceutically acceptable salt thereof.

Preferred statins are those agents which have been marketed, most preferred are fluvastatin, simvastatin, atorvastatin, or pitavastatin or a pharmaceutically acceptable salt thereof.

Preferred combinations according to the present invention comprise the combination of valsartan and an anti-hypertensive drug selected from the group consisting of the CCB amlodipine, especially the besylate thereof, the ACEI benazepril, the ACEI enalapril, the diuretic hydrochlorothiazide, the  $\beta$ -adrenergic blocker metoprolol, the statin fluvastatin, the statin pitavastatin, and the renin inhibitor aliskiren, or, in each case a pharmaceutically acceptable salt thereof.

The combination according to the present invention as described hereinbefore and hereinafter may be used for simultaneous use or sequential use in any order, for separate use or as a fixed combination.

The term "pharmaceutically acceptable salts" or "a pharmaceutically acceptable salt thereof" refer to salts prepared from pharmaceutically acceptable nontoxic acids or bases including inorganic acids and bases. Suitable pharmaceutically acceptable acid salts for the first agent and the co-agents of the present invention include acetic, benzenesulfonic (besylate), benzoic, camphorsulfonic, citric, ethenesulfonic, fumaric, gluconic, glutamic, hydrobromic, hydrochloric, isethionic, lactic, maleic, malic, mandelic, methanesulfonic, mucic, nitric, pamoic, pantothenic, phosphoric, succinic, sulfuric, tartaric acid, p-toluenesulfonic, and the like.

The pharmaceutical compositions of the present invention comprise the pharmaceutical combinations as described above plus a pharmaceutically acceptable carrier.

"SD associated with hypertension" as that term is used herein means the incidence of sexual dysfunction resulting from hypertension as well as from the medical treatment of hypertension with drugs irrespective of the presence of diabetes and hyperlipidemia.

"SD associated with hypertension and another condition, including but not limited to hyperlipidemia and diabetes" as that term is used herein means the incidence of sexual dysfunction resulting from these conditions.

The treatment of SD associated with hypertension and the treatment of SD associated with hypertension and another condition by methods described in the present invention may be demonstrated in the following pharmacological test:

An international, multi-center, double-blind, randomized, active-controlled trial, is conducted in approximately 14000 patients with essential hypertension and moderate to high cardiovascular risk profiles. In this trial, valsartan or amlodipine are administered as monotherapy. Dosages, e.g. once a day, are as follows: Valsartan is administered in 40, 80, or 160 mgs; amlodipine is administered in 2.5, 5 or 10 mgs.

For combination therapy, valsartan is administered in combination with one of amlodipine, simvastatin or hydrochlorothiazide (HCTZ). During the development of these combinations, valsartan is administered once or twice daily at 40, 80, 160 or 320 mgs. Co-administered with valsartan is Amlodipine at a dose of 2.5, 5 or 10 mgs; simvastatin at a dose of 20, 40 or 80 mgs or HCTZ at a dose of 12.5 or 25 mgs.

After the administration of the above monotherapies and combinations patients are evaluated for quality of life, including sexual function. Applicant has surprisingly found that the combinations described above achieve a therapeutic effect of lowering sexual dysfunction in the patients greater than the therapeutic effect achieved by the sum of the administration of the active ingredients separately.

Further, administration of pharmaceutical combinations of the invention have a therapeutic effect for (i) reducing sexual dysfunction associated with hypertension and (ii) reducing sexual dysfunction associated with hypertension and another condition. The administration of these combinations also achieves a synergistic therapeutic effect for (i)

reducing sexual dysfunction associated with hypertension and (ii) reducing sexual dysfunction associated with hypertension and another condition which effect is greater than the sum of the therapeutic effect achieved by administration of the active ingredients separately.

To prepare the pharmaceutical compositions of the present invention, the active ingredients, or their pharmaceutically acceptable salts, racemates or enantiomers are combined in intimate admixture by mixing, blending or combining in any manner known to those of skill in the art, with a pharmaceutically acceptable carrier. The pharmaceutically acceptable carrier may take a wide variety of forms depending on the form of preparation desired for administration. As an example, the pharmaceutical compositions comprise of from about 0.1 % to 90 %, preferably of from about 1 % to about 80 % of the active ingredients.

Any suitable route of administration may be employed for providing a mammal with a therapeutically effective amount of the pharmaceutical combinations and compositions of the present invention. For example, oral, rectal, vaginal, topical, parental (subcutaneous, intramuscular, intravenous, transdermal) and like forms of administration may be employed. Dosage formulations include ointments, foams, gels, transdermal patches, tablets (both fractionable and non-fractionable), caplets, powders for inhalations, gelcaps, capsules, elixirs, syrups, chewable tablets, lozenges, troches, dispersions, aerosols, solutions, fast-dissolving wafers, suppositories or suspensions or other known and effective delivery methods.

Oral dosing is preferred. In preparing the compositions in oral dose form, any of the usual pharmaceutical carriers may be employed including any material, composition or vehicle, such as a liquid or solid filler, diluent, excipient, solvent or encapsulating material involved in carrying, formulating or transporting a chemical agent. Specific examples are water, glycols, oils, alcohols and the like in the case of oral liquid preparations. In oral solid forms solid carriers such as starches, sugars, kaolin, lubricants, binders, disintegrating agents and the like may be employed. Oral

solid preparations are preferred over the oral liquid preparations. A preferred oral solid preparation is capsules and tablets, because of their ease of administration.

For parental compositions, the carrier will usually comprise sterile water, at least in large part, though other ingredients, to aid solubility for example, may be included. Injectable solutions, for example, may be prepared in which the carrier comprises PEG, saline solution, glucose solution or a mixture of saline and glucose solution. Injectable suspensions may also be prepared in which case appropriate liquid carriers, suspending agents and the like may be employed. In the compositions suitable for percutaneous administration, the carrier optionally comprises a penetration enhancing agent and/or a suitable wetting agent, optionally combined with suitable additives of any nature in minor proportions, which additives do not cause a significant deleterious effect on the skin. It is especially advantageous to formulate the aforementioned pharmaceutical compositions in dosage unit form for ease of administration and uniformity of dosage. Dosage unit form as used herein refers to physically discrete units suitable as unitary dosages, each unit containing a predetermined quantity of active ingredient(s) calculated to produce the desired therapeutic effect in association with the required pharmaceutical carrier.

The term "pharmaceutical combination" as used herein means a product that results from the mixing or combining of more than one active ingredient and the combination can be administered simultaneously or sequentially in any order, separately or in a fixed combination.

The dosage of the active compound can depend on a variety of factors, such as mode of administration, homeothermic species, age and/or individual condition.

Preferred dosages for the active ingredients of the pharmaceutical combination according to the present invention are therapeutically effective dosages, especially those which are commercially available.

The total daily dose range may be administered in a range of from about 0.01 mg to about 1000 mg. The daily dose range may be about 800 mg, 600 mg, 400 mg, 200 mg, 100 mg, 50 mg, 20 mg, 10 mg, 5 mg, 1 mg, .1 mg or .01 mg. Preferably, a daily dose range should be between about 2.5 mg to about 540 mg, while most preferably, a daily dose range should be between about 5 mg to about 100 mg. It is preferred that the doses are administered OD (once daily) or BID (2 times a day). In managing the patient, the therapy should be initiated at a lower dose, perhaps about 5 mg to about 10 mg, and increased up to about 50 mg or higher depending on the patient's response. It may be necessary to use dosages outside these ranges in some cases as will be apparent to those skilled in the art. Further, it is noted that the clinician or treating physician will know how and when to interrupt, adjust, or terminate therapy in conjunction with individual patient response. The term "therapeutically effective amount" is encompassed by the above-described molar ratio and dosage amounts and dose frequency schedule.

Normally, in the case of oral administration, an approximate daily dose of from about 1 mg to about 360 mg is to be estimated e.g. for a patient of approximately 75 kg in weight.

The dosage of the active compound can depend on a variety of factors, such as mode of administration, homeothermic species, age and/or individual condition.

Valsartan, as a representative of the class of AT<sub>1</sub>-receptor antagonists, is supplied in the form of suitable dosage unit form, for example, a capsule or tablet, and comprising a therapeutically effective amount, e.g. from about 20 mg to about 320 mg, of valsartan which may be administered to patients, preferably from about 80 mg to about 320 mg. The application of the active ingredient may occur up to three times a day, starting e.g. with a daily dose of 20 mg or 40 mg of valsartan, increasing via 80 mg daily and further to 160 mg daily up to 320 mg daily. Preferably, valsartan is applied twice a day with a dose of 80 mg or 160 mg, respectively, each. Corresponding doses may be taken, for example, in the morning, at mid-day or in the evening. Preferred is b.i.d. administration.

In case of calcium channel blockers, preferred dosage unit forms are, for example, tablets or capsules comprising e.g. from about 2.5 mg to about 540 mg, preferably, when using amlodipine, for example, about 2.5 mg to about 10 mg administered once a day; about

- 12 -

180 mg to about 540 mg of verapamil once a day; about 120 mg to about 360 mg of diltiazem and about 2.5 mg to about 20 mg of isradipine once a day.

In case of ACE inhibitors, preferred dosage unit forms of ACE inhibitors are, for example, tablets or capsules comprising e.g. from about 10 mg to about 80 mg, preferably 10 mg, 20 mg or 40 mg, of benazepril and from about 2.5 mg to about 20 mg, preferably 2.5 mg, 5 mg, 10 mg or 20 mg, of enalapril.

In case of Beta blockers, preferred dosage unit forms are, for example, tablets or capsules comprising e.g. from about 80 mg to about 640 mg of propranolol; from about 2.5 mg to about 20 mg of bisoprolol and from about 50 mg to about 400 mg, of metoprolol.

In case of statins, preferred dosage unit forms are, for example, tablets or capsules comprising e.g. from about 20 mg to about 80 mg of fluvastatin; from about 10 mg to about 80 mg of atorvastatin and from about 5 mg to about 80 mg of simvastatin, administered once a day.

Especially preferred are low dose combinations.

### EXAMPLES

The present invention is further described by the following examples. The examples are provided solely to illustrate the invention by reference to specific embodiments. These exemplifications, while illustrating certain specific aspects of the invention, do not portray the limitations or circumscribe the scope of the disclosed invention.

#### Formulation Example 1:

##### Film-Coated Tablets:

Components	Composition Per Unit (mg)	Standards
Granulation		
Valsartan [= active ingredient]	80.00	
Microcrystalline cellulose/ Avicel PH 102	54.00	NF, Ph. Eur
Croscopovidone	20.00	NF, Ph. Eur

- 13 -

Colloidal anhydrous silica / Colloidal silicon dioxide / Aerosil 200	0.75	Ph. Eur/ NF
Magnesium stearate	2.5	NF, Ph. Eur
Blending		
Colloidal anhydrous silica / Colloidal silicon dioxide / Aerosil 200	0.75	Ph. Eur/ NF
Magnesium stearate	2.00	NF, Ph. Eur
Coating		
Purified water <sup>*)</sup>	-	
DIOLACK pale red 00F34899	7.00	
Total tablet mass	167.00	

<sup>\*)</sup> Removed during processing.

The film-coated tablet is manufactured e.g. as follows:

A mixture of valsartan, microcrystalline cellulose, crospovidone, part of the colloidal anhydrous silica/colloidal silicon dioxide/Aerosile 200, silicon dioxide and magnesium stearate is premixed in a diffusion mixer and then sieve through a screening mill. The resulting mixture is again pre-mixed in a diffusion mixer, compacted in a roller compacter and then sieve through a screening mill. To the resulting mixture, the rest of the colloidal anhydrous silica/colloidal silicon dioxide/Aerosile 200 are added and the final blend is made in a diffusion mixer. The whole mixture is compressed in a rotary tabletting machine and the tablets are coated with a film by using Diolack pale red in a perforated pan.

#### Formulation Example 2:

Film-coated tablets:

Components	Composition Per Unit (mg)	Standards
Granulation		
Valsartan [= active ingredient]	160.00	
Microcrystalline cellulose/ Avicel PH 102	108.00	NF, Ph. Eur
Crospovidone	40.00	NF, Ph. Eur

- 14 -

Colloidal anhydrous silica / colloidal silicon dioxide / Aerosil 200	1.50	Ph. Eur/ NF
Magnesium stearate	5.00	NF, Ph. Eur
Blending		
Colloidal anhydrous silica / colloidal silicon dioxide / Aerosil 200	1.50	Ph. Eur/ NF
Magnesium stearate	4.00	NF, Ph. Eur
Coating		
Opadry Light Brown 00F33172	10.00	
Total tablet mass	330.00	

The film-coated tablet is manufactured e.g. as described in Formulation Example 1.

### Formulation Example 3:

#### Film-Coated Tablets:

Components	Composition Per Unit (mg)	Standards
Core: Internal phase		
Valsartan [= active ingredient]	40.00	
Silica, colloidal anhydrous (Colloidal silicon dioxide) [= Glidant]	1.00	Ph. Eur, USP/NF
Magnesium stearate [= Lubricant]	2.00	USP/NF
Crospovidone [Disintegrant]	20.00	Ph. Eur
Microcrystalline cellulose [= Binding agent]	124.00	USP/NF
External phase		
Silica, colloidal anhydrous, (Colloidal silicon dioxide) [= Glidant]	1.00	Ph. Eur, USP/NF

- 15 -

Magnesium stearate [Lubricant]	2.00	USP/NF
Film coating		
Opadry® brown OOF 16711 <sup>1)</sup>	9.40	
Purified Water <sup>2)</sup>	-	
Total tablet mass	199.44	

<sup>1)</sup> The composition of the Opadry® brown OOF16711 coloring agent is tabulated below.

<sup>2)</sup> Removed during processing

#### Opadry® Composition:

Ingredient	Approximate % Composition
Iron oxide, black (C.I. No. 77499, E 172)	0.50
Iron oxide, brown (C.I. No. 77499, E 172)	0.50
Iron oxide, red (C.I. No. 77491, E 172)	0.50
Iron oxide, yellow (C.I. No. 77492, E 172)	0.50
Macrogolum (Ph. Eur)	4.00
Titanium dioxide (C.I. No. 77891, E 171)	14.00
Hypromellose (Ph. Eur)	80.00

The film-coated tablet is manufactured e.g. as described in Formulation Example 1.

#### Formulation Example 4:

##### Capsules:

Components	Composition Per Unit (mg)
Valsartan [= active ingredient]	80.00
Microcrystalline cellulose	25.10
Crospovidone	13.00
Povidone	12.50
Magnesium stearate	1.30
Sodium lauryl sulphate	0.60
Shell	

Iron oxide, red (C.I. No. 77491, EC No. E 172)	0.123
Iron oxide, yellow (C.I. No. 77492, EC No. E 172)	0.123
Iron oxide, black (C.I. No. 77499, EC No. E 172)	0.245
Titanium dioxide	1.540
Gelatin	74.969
Total tablet mass	209.50

The tablet is manufactured e.g. as follows:

#### Granulation/Drying

Valsartan and microcrystalline cellulose are spray-granulated in a fluidized bed granulator with a granulating solution consisting of povidone and sodium lauryl sulphate dissolved in purified water. The granulate obtained is dried in a fluidized bed dryer.

#### Milling/Blending

The dried granulate is milled together with crospovidone and magnesium stearate. The mass is then blended in a conical screw type mixer for approximately 10 minutes.

#### Encapsulation

The empty hard gelatin capsules are filled with the blended bulk granules under controlled temperature and humidity conditions. The filled capsules are dedusted, visually inspected, weight checked and quarantined until by Quality assurance department.

#### Formulation Example 5:

Capsules:

Components	Composition Per Unit (mg)
Valsartan [= active ingredient]	160.00
Microcrystalline cellulose	50.20
Crospovidone	26.00
Povidone	25.00

- 17 -

Magnesium stearate	2.60
Sodium lauryl sulphate	1.20
Shell	
Iron oxide, red (C.I. No. 77491, EC No. E 172)	0.123
Iron oxide, yellow (C.I. No. 77492, EC No. E 172)	0.123
Iron oxide, black (C.I. No. 77499, EC No. E 172)	0.245
Titanium dioxide	1.540
Gelatin	74.969
Total tablet mass	842.00

The formulation is manufactured e.g. as described in Formulation Example 4.

Formulation Example 6:

Hard Gelatin Capsule:

Components	Composition Per Unit (mg)
Valsartan [= active ingredient]	80.00
Sodium laurylsulphate	0.60
Magnesium stearate	1.30
Povidone	12.50
Crospovidone	13.00
Microcrystalline cellulose	21.10
Total tablet mass	130.00

Examples 7 to 11:

Example	7	8	9	10	11
Components	Amount per Unit (mg)	Amount per Unit (mg)	Amount per Unit (mg)	Amount per Unit (mg)	Amount per Unit (mg)
<b>Granulation</b>					
Valsartan Drug Substance	80.000	160.00 0	40.000	320.00 0	320.00 0
Microcrystalline Cellulose (NF, Ph.Eur.)/ Avicel PH 102	54.000	108.00 0	27.000	216.00 0	216.00 0
Crospovidone (NF, Ph.Eur.)	15.000	30.000	7.500	80.000	60.000
Colloidal Anhydrous Silica (Ph. Eur.)/Colloidal Silicon Dioxide (NF)/Aerosil 200	1.500	3.000	0.750	3.000	6.000
Magnesium Stearate ( NF, Ph.Eur.)	3.000	6.000	1.500	10.000	12.000
<b>Blending</b>					
Colloidal Anhydrous Silica (Ph. Eur.)/Colloidal Silicon Dioxide (NF)/Aerosil 200	—	—	—	3.000	-
Magnesium Stearate, NF, Ph.Eur.	1.500	3.000	0.750	8.000	6.000
<b>Core Weight/mg</b>	155.000	310.00 0	77.500	640.00 0	620.00 0
<b>Coating</b>	-	-	3.800	15.000	16.000

Example 12:

Hard gelatin capsule:

Component	Amount per unit [mg]
<b>Capsule</b>	
Fluvastatin Sodium <sup>1)</sup>	21.481 <sup>2)</sup>
Calcium Carbonate	62.840
Sodium Bicarbonate	2.000
Microcrystalline Cellulose	57.220
Pregelatinized Starch	41.900
Purified Water <sup>3)</sup>	Q.S.
Magnesium Stearate	1.050
Talc	9.430
Target Capsule Fill Weight	195.92
<b>Capsule Shell</b>	
Hard gelatin Capsule Shell	48.500
<b>Branding Ink (pre-printed)</b>	
White Ink	Trace
Red Ink	Trace
<b>Target Capsule Weight</b>	<b>244.42</b>

<sup>1)</sup> includes a 2% overage for moisture<sup>2)</sup> 20 mg of free acid is equivalent to 21.06 mg Na salt<sup>3)</sup> partially removed during processing

Example 13:

## Hard gelatin capsule

Component	Amount per unit (mg)
Fluvastatin Sodium	42.962 <sup>1)2)</sup>
Calcium Carbonate	125.680
Sodium Bicarbonate	4.000
Microcrystalline Cellulose	114.440
Pregelatinized Starch	83.800
Purified Water <sup>3)</sup>	Q.S.
Magnesium Stearate	2.100
Talc	18.860
Target Capsule Fill Weight	391.840
<b>Capsule Shell</b>	
Hard gelatin Capsule Shell	76.500
<b>Branding Ink (pre-printed)</b>	
White Ink	Trace
Red Ink	Trace
<b>Target Capsule Weight</b>	<b>468.34</b>

<sup>1)</sup> includes a 2% overage for moisture

<sup>2)</sup> 20 mg of free acid equivalent to 21.06 mg Na salt

<sup>3)</sup> partially removed during processing

**Example 14:**

Round, slightly bi-convex, film-coated tablets with beveled edges:

Component	Amount per unit [mg]
<b>Table Core</b>	
Fluvastatin Sodium <sup>1)</sup>	84.24 <sup>2)</sup>
Cellulose Microcrystalline / Micro-crystalline cellulose fine powder	111.27
Hypromellose / Hydroxypropyl methyl cellulose (Methocel K100LVP CR; HPMC100 cps)	97.50
Hydroxypropyl cellulose (Klucel HXF)	16.25
Potassium hydrogen carbonate / Potassium bicarbonate	8.42
Povidone	4.88
Magnesium stearate	2.44
<b>Core Tablet Weight</b>	325.00
<b>Coating</b>	
Coating premix - Opadry Yellow (00F22737)	9.75
<b>Total Weight</b>	334.75
Water, purified <sup>3)</sup>	Q.S.

<sup>1)</sup> 84.24 mg of the sodium salt of fluvastatin is equivalent to 80 mg of fluvastatin free acid

<sup>2)</sup> to be adjusted for moisture (LOD)

<sup>3)</sup> removed during processing

**Example 15 :**

Round, biconvex, beveled-edged, film-coated tablets

Component	Unit wt./Vol. [mg]	Unit wt./Vol. [mg]	Unit wt./Vol. [mg]	Unit wt./Vol. [mg]
Benazepril Hydrochloride	5.00	10.00	20.00	40.00
Lactose Monohydrate, NF	142.00	132.00	117.00	97.00
Pregelatinized Starch, NF	8.00	8.00	8.00	8.00
Colloidal Silicon Dioxide, NF (Cab-O-Sil, M-5)	1.00	1.00	1.00	1.00
Crospovidone, NF	3.00	3.00	3.00	3.00
Microcrystalline Cellulose, NF	18.00	18.00	18.00	24.25
Hydrogenated Castor Oil, NF	8.00	8.00		
Magnesium Stearate, NF			8.00	1.75
Color:	-			0.50
Yellow-Brown (suspension)		2.00		
Red-Brown (suspension)			0.50	
Purified Water, USP	Trace	trace	trace	trace
Opadry Color:				
Yellow	8.38	8.38		
Pink			8.38	8.38
Total	193.38	190.38	183.88	183.88

Although the present invention has been described in considerable detail with reference to certain preferred versions thereof, other versions are possible without departing from the spirit and scope of the preferred versions contained herein. All references and Patents (U.S. and others) referred to herein are hereby incorporated by reference in their entirety as if set forth herein in full.

**WHAT IS CLAIMED IS:**

1. Use of a pharmaceutical combination comprising as active ingredients (i) an ARB or a pharmaceutically acceptable salt thereof; and (ii) (a) an anti-hypertensive drug or a pharmaceutically acceptable salt thereof or (b) a statin or a pharmaceutically acceptable salt thereof for the preparation of a medicament for the treatment of a patient suffering from SD associated with hypertension and another condition.
2. The use according to claim 1 or 2 wherein another condition that is associated with SD is diabetes or hyperlipidemia.
3. The use of any one of claims 1 – 3 wherein the ARB, anti-hypertensive drug or HMG-CoA reductase inhibitor, respectively, include pharmaceutically acceptable racemates or enantiomers thereof.
4. The use of any one of claims 1 – 3 wherein the ARB is selected from the group consisting of valsartan, losartan, candesartan, eprosartan, irbesartan, saprisartan, tasosartan, telmisartan, E-1477, SC-52458 and ZD-8731.
5. The use of claim 4 wherein the ARB is valsartan.
6. The use of any one of claims 1 - 3 wherein the anti-hypertensive drug is selected from the group consisting of one or more of CCBs, ACE inhibitors, diuretics, vasodilators, ARBs,  $\alpha$  and  $\beta$  adrenergic blockers, ACE inhibitors in combination with CCBs, diuretics,  $\alpha$  and  $\beta$  adrenergic blockers, and diuretics.
7. The use according to any one of claims 1 – 3 wherein the anti-hypertensive drug is a renin inhibitor or a pharmaceutically acceptable salt thereof.
8. The method according to any one of claims 1 – 3 and 6 wherein the CCBs are selected from the group consisting of diltiazem, nifedipine, nitrendipine, nimodipine, niludipine, niguldipine, nicardipine, nisoldipine, amlodipine, felodipine, isradipine, ryosidine, verapamil, gallopamil and tiapamil.

9. The use according to any one of claims 1 to 3 and 6 wherein the ACE inhibitors are selected from the group consisting of alacepril, benazepril, benazeprilat, captopril, ceronapril, cilazapril, delapril, enalapril, enaprilat, fosinopril, imidapril, lisinopril, moveltopril, perindopril, quinapril, ramipril, spirapril, temocapril, andtrandolapril.
10. The use according to any one of claims 1 – 3 and 6 wherein the diuretics are selected from the group consisting of carbonic anhydrase inhibitors, combination diuretics, loop diuretics, potassium-sparing diuretics and thiazides.
11. The use according to claim 10 wherein the thiazides is hydrochlorothiazide.
12. The use according to any one of claims 1 – 3 and 6 wherein the vasodilators are selected from the group consisting of nitroglycerin and isosorbide mono- and di- nitrate.
13. The use according to any one of claims 1 – 3 and 6 wherein the  $\beta$  adrenergic blockers are selected from the group consisting of propranolol, bisoprolol and metoprolol.
14. The use according to any one of claims 1 – 3 and 6 wherein the renin inhibitors are selected from the group consisting of aliskiren; detikiren; terlakiren; and zankiren or a pharmaceutically acceptable salt thereof.
15. The use according to any one of claims 1 – 3 wherein the statin is selected from the group consisting of atorvastatin, cerivastatin, fluvastatin, lovastatin, pitavastatin, pravastatin, and simvastatin, or, in each case, a pharmaceutically acceptable salt thereof.
16. The use according to any one of claims 1 - 3 wherein the combination comprises valsartan and an anti-hypertensive drug selected from the group consisting of amlodipine, especially the besylate thereof, benazepril, enalapril, hydrochlorothiazide, metoprolol, fluvastatin, pitavastatin, and aliskiren, or, in each case a pharmaceutically acceptable salt thereof.
17. A pharmaceutical composition for the treatment of a patient suffering from SD associated with hypertension and another condition, comprising as active ingredients (i)

- 25 -

an ARB or a pharmaceutically acceptable salt thereof; and (ii) (a) an anti-hypertensive drug or a pharmaceutically acceptable salt thereof or (b) a statin or a pharmaceutically acceptable salt thereof.

18. A method of treating a patient suffering from SD associated with hypertension and another condition, including but not limited to diabetes and hyperlipidemia comprising administering a pharmaceutical combination to the patient, wherein the pharmaceutical combination comprise as active ingredients:

- (i) an ARB or a pharmaceutically acceptable salt thereof; and
- (ii) (a) an anti-hypertensive drug or a pharmaceutically acceptable salt thereof or  
(b) a statin or a pharmaceutically acceptable salt thereof.

(12) INTERNATIONAL APPLICATION PUBLISHED UNDER THE PATENT COOPERATION TREATY (PCT)

(19) World Intellectual Property Organization  
International Bureau



(43) International Publication Date  
6 June 2002 (06.06.2002)

PCT

(10) International Publication Number  
**WO 02/043807 A3**

(51) International Patent Classification<sup>7</sup>: **A61P 9/12**,  
15/00, 3/10, 3/06, A61K 45/06, 31/55, 31/54, 31/44, 31/41  
// (A61K 31/54, 31:41) (A61K 31/44, 31:41) (A61K  
31/41, 31:365)

Singh [US/US]; 49 Osborne Avenue, New Providence, NJ  
07974 (US).

(21) International Application Number: **PCT/EP01/13976**

(74) Agent: **BECKER, Konrad**; Novartis AG, Corporate  
Intellectual Property, Patent & Trademark Department,  
CH-4002 Basel (CH).

(22) International Filing Date:  
29 November 2001 (29.11.2001)

(81) Designated States (*national*): AE, AG, AL, AM, AT, AU,  
AZ, BA, BB, BG, BR, BY, BZ, CA, CH, CN, CO, CR, CU,  
CZ, DE, DK, DM, DZ, EC, EE, ES, FI, GB, GD, GE, GH,  
HR, HU, ID, IL, IN, IS, JP, KE, KG, KP, KR, KZ, LC, LK,  
LT, LU, LV, MA, MD, MK, MN, MX, NO, NZ, OM, PH,  
PL, PT, RO, RU, SE, SG, SI, SK, TJ, TM, TR, TT, UA, US,  
UZ, VN, YU, ZA, ZW.

(25) Filing Language: English

(26) Publication Language: English

(30) Priority Data:  
60/250,540 1 December 2000 (01.12.2000) US

(84) Designated States (*regional*): Eurasian patent (AM, AZ,  
BY, KG, KZ, MD, RU, TJ, TM), European patent (AT, BE,  
CH, CY, DE, DK, ES, FI, FR, GB, GR, IE, IT, LU, MC,  
NL, PT, SE, TR).

(71) Applicant (*for all designated States except AT, US*): **NO-  
VARTIS AG** [CH/CH]; Lichtstrasse 35, CH-4056 Basel  
(CH).

Published:  
— with international search report

(71) Applicant (*for AT only*): **NOVARTIS PHARMA GMBH**  
[AT/AT]; Brunner Strasse 59 A-1230 Vienna (AT).

(88) Date of publication of the international search report:  
14 August 2003

(72) Inventor; and

(75) Inventor/Applicant (*for US only*): **SAHOTA, Pritam**,

*For two-letter codes and other abbreviations, refer to the "Guid-  
ance Notes on Codes and Abbreviations" appearing at the begin-  
ning of each regular issue of the PCT Gazette.*



**WO 02/043807 A3**

(54) Title: COMBINATIONS OF AN ANGIOTENSIN RECEPTOR ANTAGONIST AND AN ANTI-HYPERTENSIVE DRUG  
OR A STATIN, FOR THE TREATMENT OF SEXUAL DYSFUNCTION

(57) Abstract: The present invention relates to methods of treating sexual dysfunction associated with hypertension and another  
condition by administering a pharmaceutical combination of an angiotensin receptor blocker with either an anti-hypertensive drug  
or an HMG-CoA reductase inhibitor.

## INTERNATIONAL SEARCH REPORT

 Intern 31 Application No  
 PCT/EP 01/13976

## A. CLASSIFICATION OF SUBJECT MATTER

 IPC 7 A61P9/12 A61P15/00 A61P3/10 A61P3/06 A61K45/06  
 A61K31/55 A61K31/54 A61K31/44 A61K31/41 //(A61K31/54,  
 31:41), (A61K31/44, 31:41), (A61K31/41, 31:365)

According to International Patent Classification (IPC) or to both national classification and IPC

## B. FIELDS SEARCHED

Minimum documentation searched (classification system followed by classification symbols)

IPC 7 A61K

Documentation searched other than minimum documentation to the extent that such documents are included in the fields searched

Electronic data base consulted during the international search (name of data base and, where practical, search terms used)

EPO-Internal

## C. DOCUMENTS CONSIDERED TO BE RELEVANT

Category *	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
X	WO 00 13664 A (L A M PHARMACEUTICALS LLC) 16 March 2000 (2000-03-16) page 34, line 7 -page 35, line 16; claims 23,34,39,40 page 23-24 page 26, line 16-19 ---	1,2,17, 18
A	EP 0 008 227 A (AMERICAN CYANAMID CO) 20 February 1980 (1980-02-20) page 2-3; examples 1-3,15; tables 1,8 page 4, line 21-26; claim 6 page 14, line 30 -page 15, line 2 ---	1,3,17, 18
X	WO 00 01389 A (BRISTOL MYERS SQUIBB CO) 13 January 2000 (2000-01-13) page 45-47; claims 28-32 ---	1,2,6, 17,18
Y	page 51 ---	1,2,6, 17,18
	-/--	

☒ Further documents are listed in the continuation of box C.☒ Patent family members are listed in annex.

## \* Special categories of cited documents :

"A" document defining the general state of the art which is not considered to be of particular relevance

"E" earlier document but published on or after the international filing date

"L" document which may throw doubts on priority claim(s) or which is cited to establish the publication date of another citation or other special reason (as specified)

"O" document referring to an oral disclosure, use, exhibition or other means

"P" document published prior to the international filing date but later than the priority date claimed

"T" later document published after the international filing date or priority date and not in conflict with the application but cited to understand the principle or theory underlying the invention

"X" document of particular relevance; the claimed invention cannot be considered novel or cannot be considered to involve an inventive step when the document is taken alone

"Y" document of particular relevance; the claimed invention cannot be considered to involve an inventive step when the document is combined with one or more other such documents, such combination being obvious to a person skilled in the art.

"&amp;" document member of the same patent family

Date of the actual completion of the international search

20 December 2002

Date of mailing of the international search report

- 9. 04 2003

Name and mailing address of the ISA

 European Patent Office, P.B. 5818 Patentlaan 2  
 NL - 2280 HV Rijswijk  
 Tel. (+31-70) 340-2040, Tx. 31 651 epo nl,  
 Fax: (+31-70) 340-3016

Authorized officer

KANBIER D.T.

## INTERNATIONAL SEARCH REPORT

Intern..... Application No

PCT/EP 01/13976

## C.(Continuation) DOCUMENTS CONSIDERED TO BE RELEVANT

Category *	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
Y	<p>MIKHAILIDIS ET AL: "The treatment of hypertension in patients with erectile dysfunction"</p> <p>CURRENT MEDICAL RESEARCH AND OPINION, vol. 16, no. Supl, February 2000 (2000-02), pages S1-S36, XP008009894</p> <p>page S34, left-hand column</p> <p>page S32, left-hand column, paragraph 2</p> <p>-right-hand column, paragraph 1</p> <p>page S33, left-hand column, paragraph 2</p> <p>---</p>	1,2,6, 17,18
X	<p>US 5 492 904 A (WONG PANCRAS C B)</p> <p>20 February 1996 (1996-02-20)</p> <p>column 3, line 56 -column 4, line 3; claim 1; example 1</p> <p>column 1-2</p> <p>---</p>	17
X	<p>PRASAD P P ET AL: "A PHARMACOKINETIC INTERACTION BETWEEN AN ANGIOTENSIN II RECEPTOR BLOCKER (VALSARTAN) AND A CALCIUM CHANNEL BLOCKER (AMLODIPINE)"</p> <p>AMERICAN JOURNAL OF HYPERTENSION, NEW YORK, NY, US, vol. 10, 1 April 1997 (1997-04-01), page 107A XP001113153</p> <p>the whole document</p> <p>---</p>	17
X	<p>EP 0 628 313 A (TAKEDA CHEMICAL INDUSTRIES LTD) 14 December 1994 (1994-12-14)</p> <p>claims 1,18,19; examples 1,3</p> <p>---</p>	17
X	<p>WO 92 20342 A (DU PONT)</p> <p>26 November 1992 (1992-11-26)</p> <p>page 4-5; claims</p> <p>---</p>	17
X	<p>WO 99 55340 A (SANOFI SYNTHELABO)</p> <p>4 November 1999 (1999-11-04)</p> <p>page 3, line 13 -page 4, line 27; claims 1,9,10</p> <p>-----</p>	17

# INTERNATIONAL SEARCH REPORT

International application No.  
PCT/EP 01/13976

## Box I Observations where certain claims were found unsearchable (Continuation of item 1 of first sheet)

This International Search Report has not been established in respect of certain claims under Article 17(2)(a) for the following reasons:

1. ☒ Claims Nos.:  
because they relate to subject matter not required to be searched by this Authority, namely:  
**Although claim 18 is directed to a method of treatment of the human/animal body, the search has been carried out and based on the alleged effects of the composition.**
2. ☒ Claims Nos.:  
because they relate to parts of the International Application that do not comply with the prescribed requirements to such an extent that no meaningful International Search can be carried out, specifically:  
**see FURTHER INFORMATION sheet PCT/ISA/210**
3. ☐ Claims Nos.:  
because they are dependent claims and are not drafted in accordance with the second and third sentences of Rule 6.4(a).

## Box II Observations where unity of invention is lacking (Continuation of item 2 of first sheet)

This International Searching Authority found multiple inventions in this international application, as follows:

**see additional sheet**

1. ☐ As all required additional search fees were timely paid by the applicant, this International Search Report covers all searchable claims.
2. ☐ As all searchable claims could be searched without effort justifying an additional fee, this Authority did not invite payment of any additional fee.
3. ☐ As only some of the required additional search fees were timely paid by the applicant, this International Search Report covers only those claims for which fees were paid, specifically claims Nos.:
4. ☒ No required additional search fees were timely paid by the applicant. Consequently, this International Search Report is restricted to the invention first mentioned in the claims; it is covered by claims Nos.:  
**partly 1-6, 8, 16-18**

Remark on Protest

- ☐ The additional search fees were accompanied by the applicant's protest.
- ☐ No protest accompanied the payment of additional search fees.

## FURTHER INFORMATION CONTINUED FROM PCT/ISA/ 210

This International Searching Authority found multiple (groups of) inventions in this international application, as follows:

1. Claims: Partly 1-6, 8, 16-18

Combinations of an ARB, chosen from the group of valsartan, losartan, candesartan, eprosartan, irbesartan, saprisartan, tasosartan, telmisartan, E-1477, SC-52458 and ZD-8731, and an antihypertensive drug, which is a CCB, and their use in the treatment of SD associated with hypertension and diabetes.

2. Claims: Partly 1-6, 9, 16-18

Combinations of an ARB, chosen from the group of valsartan, losartan, candesartan, eprosartan, irbesartan, saprisartan, tasosartan, telmisartan, E-1477, SC-52458 and ZD-8731, and an antihypertensive drug, which is an ACE inhibitor, and their use in the treatment of SD associated with hypertension and diabetes.

3. Claims: Partly 1-6, 10, 11, 16-18

Combinations of an ARB, chosen from the group of valsartan, losartan, candesartan, eprosartan, irbesartan, saprisartan, tasosartan, telmisartan, E-1477, SC-52458 and ZD-8731, and an antihypertensive drug, which is a carbonic anhydrase inhibiting diuretic, a combination diuretic, a loop diuretic, a potassium-sparing diuretic or a thiazide diuretic, and their use in the treatment of SD associated with hypertension and diabetes.

4. Claims: Partly 1-6, 12, 17, 18

Combinations of an ARB, chosen from the group of valsartan, losartan, candesartan, eprosartan, irbesartan, saprisartan, tasosartan, telmisartan, E-1477, SC-52458 and ZD-8731, and an antihypertensive drug, which is a vasodilator, and their use in the treatment of SD associated with hypertension and diabetes.

5. Claims: Partly 1-6, 17, 18

Combinations of an ARB, chosen from the group of valsartan, losartan, candesartan, eprosartan, irbesartan, saprisartan, tasosartan, telmisartan, E-1477, SC-52458 and ZD-8731, and an antihypertensive drug, which is an ARB, and their use in the treatment of SD associated with hypertension and diabetes.

## FURTHER INFORMATION CONTINUED FROM PCT/ISA/ 210

## 6. Claims: Partly 1-6, 17, 18

Combinations of an ARB, chosen from the group of valsartan, losartan, candesartan, eprosartan, irbesartan, saprisartan, tasosartan, telmisartan, E-1477, SC-52458 and ZD-8731, and an antihypertensive drug, which is an alpha adrenergic blocker, and their use in the treatment of SD associated with hypertension and diabetes.

## 7. Claims: Partly 1-6, 13, 16-18

Combinations of an ARB, chosen from the group of valsartan, losartan, candesartan, eprosartan, irbesartan, saprisartan, tasosartan, telmisartan, E-1477, SC-52458 and ZD-8731, and an antihypertensive drug, which is a beta adrenergic blocker, and their use in the treatment of SD associated with hypertension and diabetes.

## 8. Claims: Partly 1-6, 8, 9-11, 13, 16-18

Combinations of an ARB, chosen from the group of valsartan, losartan, candesartan, eprosartan, irbesartan, saprisartan, tasosartan, telmisartan, E-1477, SC-52458 and ZD-8731, and an antihypertensive drug, which is a combination of an ACE inhibitor with a CCB, a diuretic, an alpha adrenergic blocker, and a beta adrenergic blocker, and their use in the treatment of SD associated with hypertension and diabetes.

## 9. Claims: Partly 1-5, 7, 14, 16-18

Combinations of an ARB, chosen from the group of valsartan, losartan, candesartan, eprosartan, irbesartan, saprisartan, tasosartan, telmisartan, E-1477, SC-52458 and ZD-8731, and an antihypertensive drug, which is a renin inhibitor, and their use in the treatment of SD associated with hypertension and diabetes.

## 10. Claims: Partly 1-5, 15-18

Combinations of an ARB, chosen from the group of valsartan, losartan, candesartan, eprosartan, irbesartan, saprisartan, tasosartan, telmisartan, E-1477, SC-52458 and ZD-8731, and a statin, and their use in the treatment of SD associated with hypertension and diabetes.

## 11. Claims: Partly 1-6, 8, 16-18

Combinations of an ARB, chosen from the group of valsartan, losartan, candesartan, eprosartan, irbesartan, saprisartan, tasosartan, telmisartan, E-1477, SC-52458 and ZD-8731, and

## FURTHER INFORMATION CONTINUED FROM PCT/ISA/ 210

an antihypertensive drug, which is a CCB, and their use in the treatment of SD associated with hypertension and hyperlipidemia.

## 12. Claims: Partly 1-6, 9, 16-18

Combinations of an ARB, chosen from the group of valsartan, losartan, candesartan, eprosartan, irbesartan, saprisartan, tasosartan, telmisartan, E-1477, SC-52458 and ZD-8731, and an antihypertensive drug, which is an ACE inhibitor, and their use in the treatment of SD associated with hypertension and hyperlipidemia.

## 13. Claims: Partly 1-6, 10, 11, 16-18

Combinations of an ARB, chosen from the group of valsartan, losartan, candesartan, eprosartan, irbesartan, saprisartan, tasosartan, telmisartan, E-1477, SC-52458 and ZD-8731, and an antihypertensive drug, which is a carbonic anhydrase inhibiting diuretic, a combination diuretic, a loop diuretic, a potassium-sparing diuretic or a thiazide diuretic, and their use in the treatment of SD associated with hypertension and hyperlipidemia.

## 14. Claims: Partly 1-6, 12, 17, 18

Combinations of an ARB, chosen from the group of valsartan, losartan, candesartan, eprosartan, irbesartan, saprisartan, tasosartan, telmisartan, E-1477, SC-52458 and ZD-8731, and an antihypertensive drug, which is a vasodilator, and their use in the treatment of SD associated with hypertension and hyperlipidemia.

## 15. Claims: Partly 1-6, 17, 18

Combinations of an ARB, chosen from the group of valsartan, losartan, candesartan, eprosartan, irbesartan, saprisartan, tasosartan, telmisartan, E-1477, SC-52458 and ZD-8731, and an antihypertensive drug, which is an ARB, and their use in the treatment of SD associated with hypertension and hyperlipidemia.

## 16. Claims: Partly 1-6, 17, 18

Combinations of an ARB, chosen from the group of valsartan, losartan, candesartan, eprosartan, irbesartan, saprisartan, tasosartan, telmisartan, E-1477, SC-52458 and ZD-8731, and an antihypertensive drug, which is an alpha adrenergic blocker, and their use in the treatment of SD associated with hypertension and hyperlipidemia.

## FURTHER INFORMATION CONTINUED FROM PCT/ISA/ 210

## 17. Claims: Partly 1-6, 13, 16-18

Combinations of an ARB, chosen from the group of valsartan, losartan, candesartan, eprosartan, irbesartan, saprisartan, tasosartan, telmisartan, E-1477, SC-52458 and ZD-8731, and an antihypertensive drug, which is a beta adrenergic blocker, and their use in the treatment of SD associated with hypertension and hyperlipidemia.

## 18. Claims: Partly 1-6, 8, 9-11, 13, 16-18

Combinations of an ARB, chosen from the group of valsartan, losartan, candesartan, eprosartan, irbesartan, saprisartan, tasosartan, telmisartan, E-1477, SC-52458 and ZD-8731, and an antihypertensive drug, which is a combination of an ACE inhibitor with a CCB, a diuretic, an alpha adrenergic blocker, and a beta adrenergic blocker, and their use in the treatment of SD associated with hypertension and hyperlipidemia.

## 19. Claims: Partly 1-5, 7, 14, 16-18

Combinations of an ARB, chosen from the group of valsartan, losartan, candesartan, eprosartan, irbesartan, saprisartan, tasosartan, telmisartan, E-1477, SC-52458 and ZD-8731, and an antihypertensive drug, which is a renin inhibitor, and their use in the treatment of SD associated with hypertension and hyperlipidemia.

## 20. Claims: Partly 1-5, 15-18

Combinations of an ARB, chosen from the group of valsartan, losartan, candesartan, eprosartan, irbesartan, saprisartan, tasosartan, telmisartan, E-1477, SC-52458 and ZD-8731, and a statin, and their use in the treatment of SD associated with hypertension and hyperlipidemia.

FURTHER INFORMATION CONTINUED FROM PCT/ISA/ 210

## Continuation of Box I.2

Present claims 1-5, 17 and 18 of the first invention relate to uses, compositions and methods involving an extremely large number of possible compounds by way of the term "anti-hypertensive drug". Due thereto, a lack of clarity (and/or conciseness) within the meaning of Article 6 PCT arises to such an extent as to render a meaningful search over the complete scope of the claims impossible.

Furthermore, present claims 1-3, 6, 8, 17 and 18 relate to uses, compositions and methods involving a compound defined by reference to a desirable characteristic or property, namely blocking the angiotension receptor ("ARB").

Analogically, the present claims relate to uses involving compounds defined by reference to a desirable characteristic or property, namely blocking the calcium channel ("CCBs").

The claims cover all compounds having these characteristics or properties, whereas the application provides support within the meaning of Article 6 PCT and/or disclosure within the meaning of Article 5 PCT for only a very limited number of such compounds. In the present case, the claims so lack support, and the application so lacks disclosure, that a meaningful search over the whole of the claimed scope is impossible. Independent of the above reasoning, the claims also lack clarity (Article 6 PCT). A compound cannot be sufficiently described by its mechanism of action and/or its pharmacological profile. Again, this lack of clarity in the present case is such as to render a meaningful search over the whole of the claimed scope impossible.

Consequently, the search for the first invention has been carried out for those parts of the claims which appear to be clear (and/or concise), supported and disclosed, namely those parts relating to the compounds explicitly referred to in the appropriate claims and examples, with due regard to the description.

The applicant's attention is drawn to the fact that claims, or parts of claims, relating to inventions in respect of which no international search report has been established need not be the subject of an international preliminary examination (Rule 66.1(e) PCT). The applicant is advised that the EPO policy when acting as an International Preliminary Examining Authority is normally not to carry out a preliminary examination on matter which has not been searched. This is the case irrespective of whether or not the claims are amended following receipt of the search report or during any Chapter II procedure.

# INTERNATIONAL SEARCH REPORT

Information on patent family members

International Application No

PCT/EP 01/13976

Patent document cited in search report		Publication date	Patent family member(s)	Publication date
WO 0013664	A	16-03-2000	US 6251436 B1	26-06-2001
			AU 5812999 A	27-03-2000
			CA 2342769 A1	16-03-2000
			EP 1112061 A1	04-07-2001
			JP 2002524408 T	06-08-2002
			WO 0013664 A1	16-03-2000
			US 2001022975 A1	20-09-2001
EP 0008227	A	20-02-1980	US 4254145 A	03-03-1981
			AU 530454 B2	14-07-1983
			AU 4917179 A	21-02-1980
			CA 1134270 A1	26-10-1982
			DE 2965284 D1	01-09-1983
			EP 0008227 A1	20-02-1980
			JP 55036494 A	14-03-1980
			ZA 7902935 A	25-06-1980
WO 0001389	A	13-01-2000	AU 5088899 A	24-01-2000
			BG 105205 A	28-09-2001
			BR 9911621 A	16-10-2001
			CA 2336714 A1	13-01-2000
			CN 1308536 T	15-08-2001
			CZ 20010072 A3	15-08-2001
			EE 200100006 A	17-06-2002
			EP 1094816 A1	02-05-2001
			HU 0104634 A2	28-10-2002
			JP 2002519380 T	02-07-2002
			LT 4854 B	26-11-2001
			LT 2001004 A ,B	25-07-2001
			LV 12639 A ,B	20-04-2001
			NO 20010062 A	05-03-2001
			PL 346443 A1	11-02-2002
			SK 18822000 A3	03-12-2001
			TR 200100149 T2	22-10-2001
			WO 0001389 A1	13-01-2000
			US 2002143024 A1	03-10-2002
US 5492904	A	20-02-1996	AU 664375 B2	16-11-1995
			AU 2026992 A	30-12-1992
			CA 2103276 A1	16-11-1992
			CZ 9302351 A3	16-03-1994
			EP 0584250 A1	02-03-1994
			IE 921534 A1	18-11-1992
			IL 101858 A	04-08-1996
			JP 2930252 B2	03-08-1999
			JP 6508128 T	14-09-1994
			KR 222627 B1	01-10-1999
			MX 9202243 A1	01-11-1992
			NZ 242724 A	27-09-1994
			WO 9220342 A1	26-11-1992
			ZA 9203557 A	15-11-1993
EP 0628313	A	14-12-1994	EP 0628313 A1	14-12-1994
			EP 0753301 A1	15-01-1997
			JP 3057471 B2	26-06-2000
			JP 7053373 A	28-02-1995
			SG 45336 A1	16-01-1998
			US 5721263 A	24-02-1998

# INTERNATIONAL SEARCH REPORT

Information on patent family members

Intern. Application No

PCT/EP 01/13976

Patent document cited in search report	Publication date	Patent family member(s)	Publication date
EP 0628313	A	US 6228874 B1	08-05-2001
		US 2001004640 A1	21-06-2001
		US 2001011098 A1	02-08-2001
		US 5958961 A	28-09-1999
-----			
WO 9220342	A	26-11-1992	AU 664375 B2
			16-11-1995
			AU 2026992 A
			30-12-1992
			CA 2103276 A1
			16-11-1992
			CZ 9302351 A3
			16-03-1994
			EP 0584250 A1
			02-03-1994
			IE 921534 A1
			18-11-1992
			IL 101858 A
			04-08-1996
			JP 2930252 B2
			03-08-1999
			JP 6508128 T
			14-09-1994
			KR 222627 B1
			01-10-1999
			MX 9202243 A1
			01-11-1992
			NZ 242724 A
			27-09-1994
			WO 9220342 A1
			26-11-1992
			US 5492904 A
			20-02-1996
			ZA 9203557 A
			15-11-1993
-----			
WO 9955340	A	04-11-1999	FR 2778103 A1
			05-11-1999
			AU 3425999 A
			16-11-1999
			WO 9955340 A1
			04-11-1999
-----			

**This Page is Inserted by IFW Indexing and Scanning  
Operations and is not part of the Official Record**

**BEST AVAILABLE IMAGES**

Defective images within this document are accurate representations of the original documents submitted by the applicant.

Defects in the images include but are not limited to the items checked:

- ☐ **BLACK BORDERS**
- ☐ **IMAGE CUT OFF AT TOP, BOTTOM OR SIDES**
- ☐ **FADED TEXT OR DRAWING**
- ☐ **BLURRED OR ILLEGIBLE TEXT OR DRAWING**
- ☐ **SKEWED/SLANTED IMAGES**
- ☐ **COLOR OR BLACK AND WHITE PHOTOGRAPHS**
- ☐ **GRAY SCALE DOCUMENTS**
- ☐ **LINES OR MARKS ON ORIGINAL DOCUMENT**
- ☐ **REFERENCE(S) OR EXHIBIT(S) SUBMITTED ARE POOR QUALITY**
- ☐ **OTHER:** \_\_\_\_\_

**IMAGES ARE BEST AVAILABLE COPY.**

**As rescanning these documents will not correct the image problems checked, please do not report these problems to the IFW Image Problem Mailbox.**